The author contends that "we are brought squarely to the conclusion that the fœtal placenta is chorionic," and that "from this premise phylogenetic speculation must start." He tells us that, "so far as our present knowledge enables us to judge, the discoidal is probably the primitive placental type." With this we heartily agree, and it has always appeared to the writer of the present article that the same conclusion is, on the Balfourian hypothesis (from which Prof. Minot dissents) that both the yolk-sac and allantois were primitively concerned in rendering the chorion vascular, by far the most natural one warranted by the facts. The belief in the primitive nature of the diffuse placenta is, beyond doubt, largely attributable to its non-deciduous character. With Dr. Minot, we are opposed to Ryder's theory of the "origin of the discoidal placenta by constriction of the villous area of the zonary placenta." We would rather reverse the order, and regard the zonary type as transitional between the more primitive discoidal one and the more recent and modified diffuse cotyledonary and metadiscoidal varieties, regarding the replacement of the discoidal in the zonary type as primarily due to extension consequent upon the complete withdrawal of the yolk-sac from the chorion. Under this hypothesis the simple nature of the villi of the diffuse placenta might well be considered secondary.

Dr. Minot's paper furnishes a moral which cannot be too often borne in mind, viz. that it is not necessary to look beyond the most familiar organisms for material for legitimate work: neither a "new body" nor "a hitherto undescribed organism" are indispensable to the building up of a reputation.

Mr. Allis's paper is one for which we have eagerly watched, it being (as our readers will be aware) the first of a promised series. The author maps and classifies the sense-organs of the head with minute accuracy, at the leading stages of growth. When he tells us that "as many as thirty-seven hundred" pores "were counted on the head of a single large specimen," some idea of the laboriousness of his task may be formed; and on finding that he has worked out the detailed relationships of the parts to the individual bones, that he has, in addition to working out their development, determined the limits of individual variation and taken count of abnormalities, it is clear that his labour is a labour of love. The thoroughness of his work and the beauty of his illustrations must be seen to be appreciated; and should he complete his task, maintaining the standard of excellence with which he has started, he will have merited the regard of biologists for all time. He has brought to light the surprising fact that many of the first formed openings of the cutaneous canal system fuse to form pores, and that the dendritic systems and groups of pores which, in the adult, replace these, arise to a large extent from their repeated dichotomous division.

The author deals neither with polemics nor generalities,[1] nor does he even allude to striking facts which his figures show, foreign to his immediate inquiry. Consideration of these is doubtless deferred. He deals incidentally with the neuro-epithelium of the spiracular cleft discovered by Wright; this he regards as a sense-organ, which was "regularly developed in the epidermal covering of the head along with the other organs of the infra-orbital line, but, lying near the edge of the spiracular cleft, it wandered into this cleft as it was closed." Indeed, it is upon this observation that the author's co-editor confessedly bases his belief in the migratory origin of the gustatory organs; and Mr. Allis's allied discovery that "the nasal pits are inclosed in the same way that the lateral canals are" will be welcomed with especial interest by embryologists of the hour.

We have often wondered that our American brethren should have been so tardy in working out the structure and development of their native *rarissima*. Their Opossum and their Urodeles are now receiving attention, a beginning has been made with Lepidosteus, the Gymnophiona remain. Zoologists of the Old World could desire nothing better at the hands of their New World *confrères* than a series of exhaustive monographs upon the structure and development of the animals named, uniformly with the one now under review. A better model of conscientious work it would be difficult to produce.

G. B. H.

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[1] He appears to have overlooked an important paper by Fritsch, in *Stzb. Berlin Akad.*, 1888, viii., p. 273.

THE AUGUST PERSEIDS OF 1889.

THE moon being full on the morning of August 11, it was hardly to be expected that the Perseid meteors would exhibit a notable display this year. Apart, however, from the ill effect the moonlight must certainly have exercised upon the visible character of the shower, there is no doubt that the phenomenon has proved one of minor importance. I have never observed, during the previous twenty-two years, so scanty a fall of the August meteors.

I made observations on July 26, 27, 29, 30, 31, and August 3, for the express purpose of determining the radiants of early Perseids, but failed to secure an adequate number of paths to carry out that intention. In watches extending over eleven hours I counted 89 meteors, but not more than 6 of these could have been Perseids. It was evident that this system was very feebly represented. Yet in 1887 it formed a very distinct and fairly active display as early as July 19 and 22, and I have sometimes remarked decided traces of it in the second week of July. In 1878 and several other years I observed that the Perseids made a prominent shower towards the close of that month, and it was easy to find the position of its radiant on every clear night. But this has been quite impracticable in 1889, owing to the exceptional scarcity of mteors.

On August 7, 1889, I looked towards the eastern region of the firmament during the 2½ hours from 11½h. to 14h., and recorded 28 meteors only. Amongst these were 10 Perseids with a radiant point very sharply defined at 41° + 58°. They were rather small and traversed short paths; nearly all of them appeared near the centre from which they radiated. The shower was, however, of greatly inferior character to what was expected on a date so near the maximum. The ensuing nights were pretty clear, but in the brilliant moonlight meteoric apparitions were very infrequent. On August 10 only 8 Perseids were noticed in one hour before midnight.

My recent observations would seem to indicate that we have passed through a minimum of the August meteors.

The Aquarids which are generally very abundant at the end of July were also weakly displayed this year. I registered 6 of them between July 27 and August 3, from a radiant at 336° − 13°. Of the other streams which distinguish this epoch I saw several, the principal of them being a shower of Cepheids from 329° + 62° and of Cassiopeids from 8° + 52°.

W. F. DENNING.

NOTES.

WE print to-day the Report of the Committee appointed by the Treasury on the Scientific Collections at South Kensington under the control of the Science and Art Department. It is some seventeen years since the Duke of Devonshire's Commission recommended their formation, and it would seem now that something may really be done after so long a delay. The Committee, it will be seen, discuss both the question of a new building and that of the proper organization of such collections. The eminence of the members of the Committee adds great weight to their recommendations, and the Report has been very favourably received by the Press.

The meeting of the Iron and Steel Institute in Paris on the 24th and following days of September promises to be of great interest. A large attendance of members is expected. They will be received and entertained by an influential committee under the presidency of M. Eiffel; and the French Society of Civil Engineers will entertain them at breakfast on the Eiffel Tower. Among the papers will be one by Sir Lowthian Bell on the subject of water gas, and Prof. Jordan will deal with the mining and metallurgical exhibits at Paris. Excursions will be made to the iron-works of the Loire and St. Etienne, and of the Nord, and to other centres of the iron and steel industry. Luxembourg and the works of M. Schneider at Creusot will also be visited.

Prof. Löwig has resigned his appointment as Director of the Chemical Laboratory at the University of Breslau. He has seen nearly sixty years of academical service.

A severe shock of earthquake was felt in Greece on August 26. According to a Reuter's telegram from Athens, the direction of the earthquake was from north-west to south-east. Its effects were most severe in the district of Acarnania. Most of the houses in the towns of Amerinion and Aetolikon have become uninhabitable, and chasms were formed emitting sand and water. The centre of the shock is believed to have been in the Gulf of Corinth, where the telegraph cable was broken.

The National Home-Reading Union has now opened its office at Surrey House, Victoria Embankment, W.C. Miss Mondy has been appointed Secretary to the young people's section, and Mr. George Howell, M.P., Secretary to the artisans' section. All communications concerning either of these sections should be addressed to them respectively. Miss Mondy has also been appointed Office Secretary, and communications concerning the general work of the Union, as well as concerning the general readers' section, should be addressed to the Hon. Secretary. Letters of inquiry should be accompanied by a stamped and addressed envelope.

The *Victorian Naturalist* for May and June contains a most interesting paper, by Prof. Baldwin Spencer and Mr. C. French, describing a trip through the district of Croajingolong. Speaking generally, they describe West Croajingolong as composed of Lower and Upper Silurian strata—slates, shales, sandstones, more rarely conglomerates, and at times metamorphosed by contact with irruptive rocks. The latter are in the form of (1) continuous bands of granite, or (2) a series of knobs of granite, both running along lines lying roughly north and south. In the former case they are traversed along their length by river-valleys. In districts where there are isolated knobs of granite, the rock masses stand out, forming prominent peaks and ridges. The weathering of the granite on Mount Ellery is described as most striking. On the surface it has been formed into huge boulders from 20 feet to 75 feet in height, which lie piled up on one another in indescribable confusion. One huge mass, the egg shape of which gave to the mountain the native name of "Goonegerah," stands out high above the dense forest, which, save in this instance alone, clothes to their summits the long ridges and many peaks of this wild district. So far as the insect life of the district is concerned, the most striking phenomenon seems to be the vast number of ant-hills in every part. Over large areas the mounds of "jumper" ants were so thick as to remind the travellers of "mole-hills" at home. In their study of the flora of Croajingolong they were most impressed by the numerous specimens of the cabbage-tree palm (*Livistona australis*) and the waratah (*Telopea oreades*). The existence of the latter species, peculiar to Victoria, was first discovered by Baron von Mueller during his journeying through the Genoa district in East Croajingolong. This tree, which sometimes reaches the height of 50 feet, grows with equal profusion and strength in the deepest valleys and on the tops of the loftiest hills.

The Board of Regents of the Smithsonian Institution have issued Part 1 of the Annual Report, showing the operations, experiments, and condition of the Institution, for the year ending June 30, 1886. A general appendix contains papers relating to anthropology, by various writers; a paper on certain parasites, commensals, and domiciliares in the pearl oysters, by R. E. C. Stearns; a paper on time-reckoning for the twentieth century, by S. Fleming; a report on astronomical observatories, by G H. Boehmer; and a catalogue of publications of the Smithsonian Institution, by W. J. Rhees.

Mr. J. H. Hart, Superintendent of the Botanic Gardens, Trinidad, refers, in his Report for 1888, to the comparatively large number of American and European tourists by whom these gardens are now visited. Mr. Hart has been more impressed by the energy and enthusiasm displayed by visitors from the north than by "anything seen from the European side of the world." "In fact," he says, "Europeans must look to their laurels in these matters. Speaking as one myself, it cannot be said that any prejudice dictates this expression of opinion, but I record it as a fact worthy of the attention of my countrymen." Tourists of all classes at Trinidad, it seems, agree in one respect—in their love of photographing forms of plant life which are new or strange to them. Mr. Hart is so unkind as to describe this as a "prevailing epidemic." The expenditure of dry plates in the Trinidad Gardens is "so large as to afford a rich harvest to the manufacturers."

The Committee of the Chester Society of Natural Science and Literature has issued its Report, with statement of accounts, for 1888–89. This Society was founded by Charles Kingsley in 1871, and has made steady progress in every department of its work. It has now 617 members. Originally, it included only three sections; now there are seven, "with the prospect of an eighth in the coming year." During the past year the debt on the present building was entirely wiped out through the liberality of some of the members, and the Society looks forward with satisfaction to an increase of accommodation.

A paper on the soft palate in the domestic cat, by Dr. T. B. Stowell, has been reprinted from the tenth volume of the Proceedings of the American Society of Microscopists. It is offered as a preliminary contribution to a more general inquiry "as to the phylogenesis and the function of the uvula of the palate, or the conditions which favoured or led to the uvula of the palate, or the conditions which favoured or led to the development of the uvula of the soft palate." On March 2, 1888, the same writer read before the American Philosophical Society, a paper on the glosso-pharyngeal, the accessory, and the hypoglossal nerves in the domestic cat. This paper has also been issued separately.

La Nature of August 17 contains an interesting account, by M. Angot, of the laboratories and instrumental arrangements of the Central Meteorological Office in Paris, which now occupies a large building and grounds formerly connected with the Emperor's stables, with an entrance in the Rue de l'Université. The building is lighted, when required, by electricity, and contains, in addition to the usual offices, several rooms for the verification of instruments, of which a great number are tested annually, darkened chambers for the photographic registration of earth currents and magnetic elements by instruments designed by M. Mascart. These instruments are influenced by surrounding buildings, and are principally intended for the instruction of visitors; the more accurate records are made at the Observatory of the Parc St. Maur. Another large room is devoted to the apparatus invented by M. Weyher for reproducing atmospheric whirls artificially. In the grounds are evaporation tanks, and a platform for anemometers of various descriptions; the records of one of Richard's sensitive instruments are compared with a similar instrument on the Eiffel Tower, and it is said that the comparison has already led to some interesting results; the platform also contains an actinometer on M. Violle's principle, with two spheres, one blackened and the other gilded. It is intended to erect in the garden a whirling machine for anemometer experiments, having a circumference of 40 metres, with a maximum motion, by electricity, of one revolution per second, which is equivalent to about 90 miles per hour.

Das Wetter for August contains the first part of a lecture by Dr. W. Köppen, entitled "Biological Considerations upon Cyclones and Anticyclones." He points out that the word cyclone was first proposed by Piddington, in his "Sailor's Horn-Book," in 1848, to describe the violent hurricanes of the tropics, in which the wind rotates, in the northern hemisphere, in a direction opposite to the hands of the watch. The term anticyclone was first used by Mr. F. Galton, in his "Meteorographica," in 1863, to represent the opposite class of atmospheric disturbance, in which the wind circulates in the same direction as the hands of a watch. The use of synoptic charts, with isobaric lines, drawn for large areas, shows that the same cyclonic motion occurs in our latitudes, in all degrees of force, down to a gentle breeze. This constitutes one of the most important discoveries of modern meteorology, which dates from about the year 1860. The author points out that the circuitous motions of the atmosphere, whether cyclonic or anticyclonic, consist of three component parts, which can be proved by the laws of mechanics, viz. one rotating motion, one in the direction of the radius, and one perpendicularly to both of these, parallel to the axis of the whirl. The behaviour of the atmospheric motions in the higher regions is more difficult to describe, but so much seems certain from observations of clouds, &c., that the rotation is similar to that below, but the component falling in the direction of the radius is the opposite to that below, viz. an indraught below corresponds to an outflow above. He explains the more frequent gyration of the wind-vane to the right than to the left by the fact that stations in our parts are generally to the right of the storm-areas. He also shows how the ascending current of cyclones produces cloud and rain, by cooling and condensation of vapour, and how the descending current in anticyclones produces dry and bright weather. The remaining article is a discussion by Dr. Kremsèr, of the extraordinarily high temperatures in North Germany during May and June last. He has compared the daily temperatures of the last forty-two years with those for 1889, and shows the result in a diagram; from which it is seen that for the whole period (April 19–June 20) the temperature was on an average 9° above the normal value. The author states that the Berlin observations, which date back to 1719, show that no May has been so warm, and that the temperature of June has only once been slightly higher, viz. in the year 1756.

MR. EDWARD STANFORD has published a little volume containing useful "Algerian Hints for Tourists," by Mr. Charles E. Flower. The writer intends that it shall be used as an appendix to the guide-books. He tells his readers what there is in Algeria to see, and "how to get to see it." For further information they are directed to the guide-books properly so called.

WE have received Parts 11 and 12 of the Transactions of the Leicester Literary and Philosophical Society. Part 12 includes the Report of the Council, and the Annual Reports of the Sections, presented to the general meeting on June 24.

MESSRS. GEORGE PHILIP AND SON have issued, in two sheets, an excellent topographical map of the Riviera. It has been published by A. Donath, in Genoa.

THE Calendar of University College, Dundee, for the seventh session, 1889–90, has been issued. University College, Bristol, has also published its Calendar for the session 1889–90. In a prefatory note attention is called to the fact that the Bristol College particularly affords appropriate instruction in those branches of applied science which are more nearly connected with the arts and manufactures.

"FLOWERLAND," an introduction to botany, by Robert Fisher, is about to be issued by Messrs. Bemrose and Sons. The work includes 150 illustrations.

AT a recent meeting of the Vaudois Society of Natural Sciences, Prof. Blanc gave some interesting information about lake trout reared at the agricultural station of Champ de l'Air. The peculiarity of the experiment was keeping the ova in complete darkness throughout the time of incubation. The water used had a temperature of 4°·8 C. Prof. Blanc compares the experiment with one at Moudon. There, with a temperature of 2°·3, the hatching occurred after 145 days. At Champ de l'Air (temperature 4°·8), it occurred after 160 days, a difference of 15 days, due to the darkness. There are sundry advantages in prolonging the incubation: (1) the young fry put into the streams in April or May more readily find food than in February or March; (2) they are found to be more vigorous; (3) there are few or no monstrosities.

SOME curious facts bearing on the *morale* of the lower animals are given by a correspondent of the *Revue Scientifique*. One source of animal sociability is a permanent sexual friendliness, making individuals mutually agreeable. Thus in stables without stalls, it is desirable to put animals of opposite sex next each other, to avoid injuries. A mare may be safely put into a field containing a horse unknown to it, but if two unacquainted horses be thus put together they will fight. A stallion, indeed, will sometimes get injury from an unknown mare put into a field with it. Again, the authority of the oldest and strongest in a group of males often favours sociability. In the Spanish *ganaderias*, a horseman will lead about a numerous troop of bulls, by means of five or six bulls who obey him and maintain order. In the Madrid circus the writer saw three of these animals bring to its stall a vicious bull which had ripped up five or six horses and mortally wounded its *Espada*. They made a slight movement of the horns, and the creature, after a little hesitation, turned and followed them. Once more, when flocks of wild ducks and geese have to go long distances, they form a triangle to cleave the air more easily, and the most courageous bird takes position at the forward angle. As this is a very fatiguing post, another bird, ere long, takes the place of the exhausted leader. Thus they place their available strength at the service of the society.

THE attention of the French Government has recently been drawn to the destruction of small fish, especially flat-fish, round the coasts, by shrimp trawls, and the question was referred to the French Fisheries Committee to be inquired into. The Committee have now published their report, in the *Journal Officiel*, in which they recommend the entire prohibition of fishing for shrimps with trawls, and advocate in its place the adoption of two other methods which were brought to their notice at Croisic and at Saint Gilles, where they are already in practical use. At Croisic the engine consists of a trap, somewhat on the principle of an ordinary lobster-pot; it is a wooden frame, in shape like a barrel, and about 2 feet 6 inches long, covered with a small meshed net drawn in at the ends, thus forming two funnels. Each funnel terminates in a small opening through which the shrimps are attracted by bait suspended inside the trap. The machine, which is weighted with stones made fast to the frame, is further provided with a mooring line, and cork float. These traps, of which each fisherman may own from twenty-five to thirty, are kept permanently on the fishing-grounds during the shrimping season, and are visited daily, when the catches are taken out through a hinged opening at the side, and fresh bait put in. The second method recommended consists of a conical pocket of small meshed net about 18 inches deep, fixed to an iron ring with a diameter of 2 feet 6 inches to 3 feet. Four short lines are attached to the ring, and are made fast to a rope and cork float. The bait, which consists of bits of fish, is either placed at the bottom of the pocket or on two lines stretched across the iron ring. These nets require to be raised every 15 or 30 minutes; they should be sunk so that the ring just rests on the bottom, the supporting lines being kept clear of the bait by means of a float fastened at the junction of the lines with the mooring rope. This method is said to be most successful when carried on at low water in the early morning.

A RECENT number of the *China Review* (vol. xvii. No. 3) contains a paper by Dr. Macgowan on the alleged avenging habits of the cobra in Indian and Chinese folk-lore. The belief in India is that a wounded cobra which escapes will sooner or later revenge itself on the man who has caused the injury, wherever he may go or whatever he may do. Dr. Macgowan says that this belief is prevalent in Indo-China and China as well as in India. But in China there is also a strong prejudice against killing the cobra, lest its spirit should haunt the slayer ever after. Cobras, therefore, are shunned rather than pursued and attacked. Popular stories of the dire consequences of slaying them keep up the superstition: a high official who had killed one died soon afterwards of some mysterious disease, and the death is attributed to the slain snake; again, the spirit of the snake enters into possession of its slayer, and employs the vocal organs of the latter in uttering imprecations on himself until death mercifully removes him. Dr. Macgowan gives a large number of stories of this character. A number of others refer to the retribution on snake-killers after their own deaths. Gratitude, as well as vindictiveness, is ascribed to snakes, of which some characteristic stories are given. In conclusion, Dr. Macgowan observes that the recently established vernacular press in China furnishes inexhaustible stores of folk-lore. "Paragraphs describing popular superstitions, impossible occurrences, monstrosities, and so forth, constitute a great portion of their matter." In regard to snakes, the marvel is that any are killed at all in China, so many dreadful punishments are supposed to overtake their destroyers; and, indeed, it is considered a work meriting favour here and hereafter to purchase captured snakes and liberate them. Nevertheless, poisonous snakes are not numerous in China, probably because their presence is inconvenient to Chinese farmers, and they are therefore destroyed, folk-lore notwithstanding.

IN connection with the recent discussion, in Parliament and elsewhere, respecting emigration to South America, it may be interesting to reproduce certain observations of Dr. Alfredo da Luy, at a late meeting of the Academy of Medicine at Rio, on the effect of climate on race. They are quoted in a report from the British Legation in Brazil, which has recently been published. "I have long noticed," he says, "that Brazilians in general are more pallid, and are less vigorous and energetic, than persons coming from temperate and cold climates. Here in Rio de Janeiro the degeneration of the Portuguese race may also be noted. In fact such inhabitants of Rio de Janeiro as are not coloured persons are generally pallid, weak, of short stature, and of but little muscular strength. I have found that an anæmic condition is very common among us, and, in most cases in our country, malarious infection is the cause of the impoverishment of blood, whenever this impoverishment exceeds physiological limits. I believe, however, that such malarious impoverishment of blood seldom kills by itself, but this it is which makes children in Rio de Janeiro show so little resistance to other maladies, and it is one of the causes which concur to produce the great infant mortality in the city of Rio de Janeiro. The average annual mortality of children in Rio de Janeiro, up to seven years of age, was 2900 in the five years from 1882 to 1886, excluding those born dead. It is chiefly among the children of Europeans resident in Brazil that I have met with the most accentuated impoverishment of blood and debility, and I believe the explanation to be marshy malaria (*impaludismo*). I have noticed in my practice that the children of Portuguese and Italians do not fare so very badly in the Brazilian climate, but that the children of foreigners coming from the north of Europe show a noted physical degeneracy, and a frail vital resistance, so that the greater part of them succumb at a tender age, and even if they reach adult life they never show any grade of robustness and energy comparable to that of their progenitors. Although I am fully persuaded of the good moral qualities of the European colonist, I think it my duty to state that Germans, French, Belgians, and other persons from climates very different from ours, will never be able to give a prosperous colonization to our warmer provinces, except in the case of crossing with races better adapted to hot climates."

IN Consul-General Playfair's Report to the Foreign Office on the agriculture of Algeria, it is said that viticulture in that country is beset with many dangers. In spring, hailstorms frequently destroy the young shoots; the flowers are often ruined by fogs; and the ripe fruit by the sirocco. The most serious enemy is, of course, the *Phylloxera*, but the officials have been fairly successful in dealing with this pest. Another is the *altise*, a small beetle that causes great destruction, particularly when in its larval condition. The mode of killing the *altise* commonly adopted is to place bundles of grass and vine-cuttings around the vineyard when winter is approaching; in these the insects conceal themselves in large compact masses, and the whole is then set on fire. Other diseases are the *oïdium*, *anthrachnosis*, *peronospera*, and *chlorosis*. It is calculated that the want of intelligent treatment of these diseases causes the owners of the vineyards to lose annually nearly a third of the crop. The olive seems to grow everywhere in Algeria except in marshy ground, and attains dimensions quite unknown on the northern coast of the Mediterranean. At present, however, from careless cultivation, the plant has not proved as remunerative, nor have its products been as good, as in Europe.

THE British Consul at Bogota, in his last Report to the Foreign Office on the agricultural condition of Colombia says that for tobacco cultivation in that country no manure is used, and the same land is used over and over again for an indefinite number of years. In some districts, where disease has completely exterminated the tobacco plantations, it has been found that when plants are brought from other districts they are not attacked for a few years, but ultimately they are also destroyed. This, perhaps, might be avoided by constantly importing fresh seed; but the experiment was tried on some of the best tobacco land in Colombia, with the result that as the seed brought from inferior districts began gradually to improve by transportation to the better soils, it became more liable to disease, while the plants grown from seeds brought from the better districts were attacked at once. Another instance of the ignorance of scientific agriculture in Colombia appears in the case of cocoa. It is most carelessly cultivated, though it is a crop which requires constant care and labour to weed and clean the ground, and free the trees of the numerous insects, especially the caterpillars, which infest them. A most destructive disease has lately attacked the trees in the south of the Tolima, which is one of the very richest districts in Colombia. This disease does not seem to have been investigated, and no remedy has been suggested, but the extent of its ravages will be understood from the fact that one of the plantations attacked produced only 175 pounds instead of 18,000 pounds of cocoa.

THE additions to the Zoological Society's Gardens during the past week include a Formosan Deer (*Cervus taĕvanus* ♂), a Japanese Deer (*Cervus sika* ♀) from Japan, two Three-striped Paradoxures (*Paradoxurus trivigatus*), a Great Eagle Owl (*Bubo maximus*) from China, presented by Capt. C. Taylor s.s. *Aberdeen*; a Common Fox (*Canis vulpes* ♀), British, presented by Mr. Edward Hall; a Bewick's Swan (*Cygnus bewicki*) from China, presented by Mr. Jansen; a Peregrine Falcon (*Falco peregrinus*) from Cyprus, presented by Dr. W. Hoad; a Mantchurian Crane (*Grus viridirostris*) from North China, eighteen Spanish Blue Magpies (*Cyanopolius cooki*) from Spain, an Indian Python (*Python molurus*) from India, two Water Rattlesnakes (*Crotalus adamanteus*) a Mocassin Snake (*Tropidonotus fasciatus*) from North America, deposited; five African Lepidosirens (*Protopterus annectans*) from the River Gambia, West Africa, purchased; a Royal Python (*Python regius*) from West Africa, received in exchange; an Indian Muntjac (*Cervulus muntjac* ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET 1889 *d* (BROOKS, JULY 6.)—The following elements and ephemeris for this object are by Herr Otto Knopf (*Astr. Nach.*, No. 2916):—

$$T = 1889 \text{ July } 12{\cdot}2616 \text{ Berlin M.T.}$$

$$\left.\begin{array}{rl} \pi = & 330^\circ\ 7'\ 5'' \\ \text{☊} = & 29\ \ 4\ 56 \\ \iota = & 5\ 44\ \ 7 \end{array}\right\}\text{ Mean Eq. } 1889{\cdot}0.$$

$$\log q = 0{\cdot}35280$$

Error of middle place (O – C).

$$d\lambda \cos\beta = +20''\ ;\ d\beta = -2''.$$

The observations on which these elements are based were obtained at Lick, July 8; Vienna, July 21; and Dresden, July 30.

Ephemeris for Berlin Midnight.

1889.	R.A. h. m. s.	Decl. ° ′	Log *r*.	Log Δ.	Brightness.
Aug. 31	0 7 30	5 53·2 S.	0·3665	0·1326	1·37
Sept. 4	0 6 29	5 48·4	0·3686	0·1324	1·36
8	0 5 14	5 43·8 S.	0·3709	0·1333	1 34

The brightness on July 8 is taken as unity.

On August 1, Mr. Barnard observing at the Lick Observatory, found the comet to be composed of three distinct adjacent comets, perhaps more; and Prof. Weiss, under date August 6, reported it as fourfold.

COMET 1889 *e* (DAVIDSON).—Dr. Becker gives the following elements and ephemeris for this comet, derived from observations made at Rome on July 26, Vienna on August 4, and Dun Echt on August 15.

$$T = 1889 \text{ July } 19{\cdot}29538 \text{ G.M.T.}$$

$$\left.\begin{array}{rl} \pi - \text{☊} = & 345^\circ\ 53'\ \ 6''{\cdot}9 \\ \text{☊} = & 286\ \ 8\ 16{\cdot}2 \\ \iota = & 65\ 59\ 59{\cdot}7 \end{array}\right\}\text{ Mean Eq } 1889{\cdot}0.$$

$$\log q = 0{\cdot}016949$$

$$\Delta\lambda \cos\beta = +6''{\cdot}6\ ;\ \Delta\beta = -0''{\cdot}3\ ;\ (\text{O} - \text{C}).$$

Ephemeris for Greenwich Midnight.

1889.	R.A. h. m. s.	Decl. ° ′	Log Δ.	Log *r*.	Brightness.
Aug. 28	16 9 43	24 8·2 N.	9·9432	0·0919	0·12
Sept. 1	16 18 58	25 47·5	9·9794	0·1043	0·10
5	16 27 38	27 9·7	0·0125	0·1170	0·08
9	16 35 53	28 18·8	0·0429	0·1299	0·06
13	16 43 49	29 17·6	0·0708	0·1428	0·05
17	16 51 34	30 8·2	0·0966	0·1557	0·04
21	16 59 12	30 52·3 N.	0·1205	0·1686	0·04

The brightness on July 22 has been taken as unity.

NEW MINOR PLANETS.—Two new minor planets were discovered on August 3; the one, No. 285, by Herr Palisa at Vienna, the other, No. 286, by M. Charlois at Nice.

NEW DOUBLE STARS.—Mr. Burnham reports that η Ophiuchi is a close double, the two components being of nearly equal magnitude. The present position of the fainter is angle = 274°·7, and distance = 0″·35. It will probably be found to be a binary of somewhat short period.

θ Cygni has a small companion at position-angle 43°·9, and distance 3″·62, recently discovered by Mr. Burnham. The companion is about the fourteenth magnitude.

STARS WITH REMARKABLE SPECTRA.—The examination of the photographs of stellar spectra taken at Harvard College in connection with the Henry Draper Memorial has shown DM + 43° No. 3571 to have a spectrum crossed by bright lines, and similar to those of the three stars discovered by Wolf and Rayet in 1867. Two other stars, DM + 66° No. 878, and DM + 84° No. 516, especially the latter, have the most strongly marked spectra of Secchi's third type which have yet been recognized, except in the case of some variables of long period.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 SEPTEMBER 1–7.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on September 1

Sun rises, 5h. 15m.; souths, 11h. 59m. 46·7s.; daily decrease of southing, 18·9s.; sets, 18h. 45m.: right asc. on meridian, 10h. 43·1m.; decl. 8° 8′ N. Sidereal Time at Sunset, 17h. 30m.

Moon (at First Quarter September 2, 20h.) rises, 11h. 59m.; souths, 16h. 50m.; sets, 21h. 31m.: right asc. on meridian, 15h. 33·9m.; decl. 15° 29′ S.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Right asc. and declination on meridian. h. m.	° ′
Mercury	7 10	13 14	19 18	11 58·0	0 5 N.
Venus	1 33	9 23	17 13	8 6·4	19 33 N.
Mars	2 59	10 33	18 7	9 16·1	17 5 N.
Jupiter	15 16	19 9	23 2	17 53·6	23 26 S.
Saturn	3 54	11 11	18 28	9 54·1	14 1 N.
Uranus	9 3	14 30	19 57	13 13·9	7 12 S.
Neptune	21 39*	5 29	13 19	4 11·7	19 26 N.

* Indicates that the rising is that of the preceding evening.

Sept.	h.	
4	2	Jupiter in conjunction with and 1° 2′ south of the Moon.
7	8	Neptune stationary.

Variable Stars.

Star.	R.A. h. m.	Decl. ° ′		h. m.	
S Arietis	1 58·7	12 0 N.	Sept. 1,		*M*
R Arietis	2 9·8	24 32 N.	,, 7,		*M*
R Ursæ Majoris	12 31·3	60 6 N.	,, 5,		*M*
R Boötis	14 32·3	27 13 N.	,, 2,		*M*
δ Libræ	14 55·1	8 5 S.	,, 5,	0 22	*m*
U Coronæ	15 13·7	32 3 N.	,, 3,	2 1	*m*
U Ophiuchi	17 10·9	1 20 N.	,, 3,	0 46	*m*
			,, 3,	20 54	*m*
X Sagittarii	17 40·6	27 47 S.	,, 2,	1 0	*M*
W Sagittarii	17 57·9	29 35 S.	,, 2,	22 0	*M*
Y Sagittarii	18 14·9	18 55 S.	,, 1,	1 0	*m*
β Lyræ	18 46·0	33 14 N.	,, 4,	23 0	m_2
R Lyræ	18 52·0	43 48 N.	,, 5,		*M*
U Aquilæ	19 23·4	7 16 S.	,, 5,	2 0	*m*
T Vulpeculæ	20 46·8	27 50 N.	,, 1,	0 0	*M*
δ Cephei	22 25·1	57 51 N.	,, 3	23 0	*m*

M signifies maximum; *m* minimum; m_2 secondary minimum.

Meteor-Showers.

	R.A. °	Decl. °	
Near ρ Persei	43	39 N.	Swift; streaks.
,, 33 Cygni	305	55 N.	Swift; bright.
,, γ Piscium	347	0	Slow; bright.